

NAVSEA  
STANDARD ITEM

FY-00

ITEM NO: 009-36  
DATE: 06 NOV 1998  
CATEGORY: II

1. SCOPE:

1.1 Title: Controller; repair

2. REFERENCES:

- a. Standard Items
- b. Equipment Instruction Manual
- c. MIL-STD-870, Cadmium Plating, Low Embrittlement, Electrodeposition
- d. S9086-KC-STM-010/CH-300, Electric Plant - General
- e. DOD-STD-2003, Electric Plant Installation Standard Methods for Surface Ships and Submarines
- f. S9300-A6-GYD-010, Electrical Workmanship Inspection Guide for Surface Ships and Submarines
- g. MIL-STD-1310, Shipboard Bonding, Grounding, and Other Techniques for Electromagnetic Compatibility and Safety

3. REQUIREMENTS:

3.1 Disconnect electrically and mechanically and remove the controller. Record and retain electrical hookup data.

3.1.1 Matchmark, identify, and retain shims.

3.1.2 Inspect foundations for cracks, areas of distortion, and deterioration in excess of 25 percent of the thickness of each member of the structure.

3.1.2.1 Submit four legible copies of a report listing results of the requirements of 3.1.2 to the SUPERVISOR.

3.1.3 Accomplish the requirements of 009-32 of 2.a for the foundation of the removed equipment.

3.2 Disassemble the controller and clean components free of foreign matter.

3.3 Inspect the controller enclosure, mounting boards, and components for mechanical and physical defects, improper values, and internal wiring for conformance to 2.b and controller wiring diagram.

3.3.1 Test internal wiring and coils for opens. **Test** insulation resistance to ground and between conductors, **using a 500 volt megger**. Record readings. Minimum acceptable resistance to ground shall be **one** megohm.

3.3.1.1 Disconnect solid-state devices prior to measuring insulation resistance.

3.3.2 Submit four legible copies of a report listing results of the requirements of 3.3 and 3.3.1 to the SUPERVISOR.

3.4 Repair the controller, using 2.b for guidance.

3.4.1 Straighten the enclosure and door. Free-up hinges and align door. Plug and seal unused cable openings.

3.4.1.1 Install ground straps on each door on controllers with door mounted energized components in accordance with MIL-E-2036 for those found to be missing or defective.

3.4.2 Accomplish the requirements of 009-32 of 2.a for the interior and exterior of the enclosure.

3.4.3 Remove existing and install new enclosure gaskets.

3.4.4 Remove existing and install new door fasteners where found to be defective. Install new door fasteners where missing.

3.4.5 Remove existing and install new molded-rubber switch covers.

3.4.6 Remove existing and install new components where found to be defective or of improper value. Install new components where missing. Remove existing and install new wiring in place of wiring found to be defective or frayed. Install new wiring where missing.

3.4.7 **Inspect**, dress and adjust contacts.

3.4.7.1 **Install new contacts where found to be defective** or resilver contacts in accordance with QQ-S-365.

3.4.8 Replate cadmium plated parts in accordance with 2.c. **Replate zinc-plated items in accordance with ASTM Standard A153. In localities with environmental or air pollution restrictions against cadmium plating, use zinc plating for all plated steel parts.**

3.4.9 Wash, dip and bake, tape insulated coils and open transformers. Dipping shall be in varnish conforming to MIL-I-24092, Class 155.

3.4.9.1 Dip and bake coils and open transformers in Dolph 1105, Epoxylite Esterlite 605, or Schenectady International Isolite 862M varnish in localities where MIL-I-24092 varnish does not meet state and local Air Pollution Control District (APCD) Standards.

3.4.9.2 Repair and reinsulate coil and transformer leads.

3.4.10 Free-up and lubricate moving parts.

3.4.11 Adjust timing devices, relays, and contactors.

3.4.12 Repair defective connections.

3.4.13 Install a new wiring diagram and new heater table in the controller. The new diagram shall reflect actual configuration of the controller in which it is installed. New diagrams shall be sealed in transparent plastic and shall be mounted on the inside of the controller so as to be conveniently accessible.

3.5 Assemble the controller.

3.5.1 Dress and shape wiring and wire harnesses for neat appearance. Install wire clamps on both ends of wire hinges. Install flexible insulating tubing over wire hinges to prevent chafing.

3.5.2 Install new threaded fasteners, washers, and lockwashers to replace missing fasteners and those that are no longer serviceable.

(V) "SHOP OPERATIONAL TEST"

3.6 Accomplish an operational test of the controller and adjust to ensure correct operation in accordance with the wiring diagram of 3.4.13, using 2.b for guidance.

(V) "INSULATION RESISTANCE TEST"

3.6.1 Accomplish 500-volt megger insulation resistance test, using Paragraphs 300-3.2.2 through 300-3.2.3, 300-3.4.8, 300-3.4.11, and 300-5.3.7.1 of 2.d for guidance.

3.7 Install the controller, installing new fasteners conforming to MIL-S-1222, Type I or II, Grade 5, zinc coated, using shims retained in 3.1.1.

3.7.1 Fasteners requiring a permeability factor of 2.0 or less shall conform to Grade 304 CRES.

3.7.2 Remove existing and install new wire markers in place of wire markers found to be illegible. Install new wire markers where missing. New wire markers shall conform to MIL-I-23053, Class One, white, marked with indelible ink.

3.7.3 Repair and reinsulate cable ends terminating in the controller in accordance with Section One of 2.e. Resleeve conductors over 9000 circular mils.

3.7.4 Remove defective and install new lugs, using 2.f for accept or reject criteria. Install new lugs where missing. New lugs shall conform to MIL-T-16366 or MIL-T-7928.

3.7.5 Bond and ground equipment in accordance with 2.g.

3.8 Reconnect the controller with the exception of the motor leads and the brake leads if applicable, using retained data in 3.1.

(V) "PRELIMINARY SEQUENCE TEST"

3.8.1 Accomplish a preliminary sequence test of the controller by cycling the controller through three start and stop cycles from each local and remote pushbutton station. Observe controller for proper sequence. Correct deficiencies. Connect the motor leads and brake leads, if applicable, at completion of sequence test.

(V)(G) "OPERATIONAL TEST"

3.9 Accomplish an operational test of the controller with its associated motor for designed sequence of operation. Verify correct speed selection, correct motor rotation in each mode, and correct value of overload heater coils based on motor nameplate full load running current.

#### 4. NOTES:

4.1 Equipment instruction manual and drawings will be referenced in the invoking Work Item.